Elective lumbar spinal decompression in the elderly: Is it a high-risk operation?

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Introduction: Spinal degeneration leading to spinal stenosis is increasingly common in an aging population. Many patients are not referred for operation because of the fear of severe complications. The purpose of this study was to relate the surgical risks involved in elective spinal decompression in elderly patients to those of total hip arthroplasty, a well-accepted procedure whose risks and benefits are well known. **Methods**: We reviewed the charts of 68 consecutive patients who underwent elective spinal decompression and fitted our inclusion criteria (65–80 yr of age, no spinal or hip operations, no hip fractures, spine fractures or cauda equina syndrome and no bone or metastatic disease). This group was matched with a similar group of 68 randomly selected patients who underwent total hip arthroplasty during the same period. We recorded the age, gender, American Society of Anesthesologists (ASA) score, early postoperative complication rate, operative time, hospital stay and blood lost. **Results**: The 2 groups were well matched with respect to age, gender and ASA score. The only significant intraoperative difference was operative time, with the spine procedure taking longer to complete (191 min v. 278 min). Blood loss was not significantly different. Both groups had a similar number of life-threatening complications (12 v. 14). The number of minor complications was greater in the spinal decompression group (62 v. 125). **Conclusions**: Elective lumbar spinal decompression in elderly patients suffering significant pain or disability due to degenerative lumbar spinal stenosis is worthwhile. We recommend judicious use of conservative measures, but encourage referral for surgical management when these fail. This operation, even when instrumentation and bone grafting are required, is not associated with more serious or life-threatening risks than a total hip replacement in elderly patients.

Introduction : La dégénérescence à l'origine de la sténose du canal rachidien est de plus en plus courante dans une population vieillissante. Beaucoup de patients ne sont pas référés pour une intervention chirurgicale par crainte de complications graves. Cette étude visait à établir un lien entre les risques chirurgicaux reliés à une décompression élective du canal rachidien chez les patients âgés à ceux que présente une arthroplastie totale de la hanche, intervention bien acceptée dont les risques et les avantages sont bien connus. **Méthodes :** Nous avons étudié les dossiers de 68 patients consécutifs qui ont subi une décompression élective du canal rachidien et correspondaient à nos critères d'inclusion (âgés de 65 à 80 ans, aucune intervention préalable à la colonne ou à la hanche, aucune fracture de la hanche ni de la colonne, aucun syndrome de la queue de cheval, aucune ostéopathie ni maladie métastatique). On a jumelé ce groupe à un groupe correspondant de 68 patients choisis au hasard qui ont subi une arthroplastie totale de la hanche au cours de la même période. Nous avons consigné l'âge, le sexe, le résultat selon l'American Society of Anesthesiologists (ASA), le taux de complications peu après l'intervention, la durée de l'intervention et du séjour à l'hôpital, et la perte de sang. **Résultats :** Les deux groupes étaient bien jumelés quand à l'âge, au sexe et au résultat selon l'ASA. La durée de l'intervention a été la seule différence intraopératoire importante. L'intervention à la colonne a pris plus de temps (191 minutes c. 278 minutes). La perte de sang n'a pas été très différente. Les deux groupes ont connu un nombre semblable de complications potentiellement mortelles (12 c. 14). Les complications mineures ont été nombreuses chez les sujets du groupe qui ont subi une décompression du canal rachidien (62 c. 125). **Conclusions :** La décompression élective du canal rachidien lombaire chez les patients âgés qui ont beaucoup de douleur ou une grande incapacité à cause d'une sténose dégénérative du canal rachidien lombaire vaut la peine d'être pratiquée. Nous recommandons le recours judicieux aux mesures de conservation, mais nous encourageons la référence pour prise en charge chirurgicale lorsque ces mesures échouent. Cette intervention, même lorsqu'il faut des instruments et des greffes osseuses, n'est pas associée à plus de risques graves ou potentiellement mortels que l'arthroplastie totale de la hanche chez les patients âgés.

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As the patient population ages, the number of people suffering from spinal stenosis secondary to degenerative disorders of the spine is increasing.[1] The severity of symptoms ranges from mild pain radiating into the buttock area with intermittent claudication to paraplegia. Urgent decompression is indicated in relatively rare cases when there is worsening neurologic deficit or loss of bowel or bladder function. Much more common are the patients with long-standing, slowly progressive stenosis and worsening function secondary to spinal degeneration. Congenital narrowing, hypertrophy of the facet joints, disk protrusion, degenerative spondylolisthesis and thickening of the ligamentum flavum all contribute to narrowing of the spinal canal. The natural history of spinal stenosis is similar to that of osteoarthritis and progresses over a number of years.[2] Conservative measures are indicated in the early stages but do not constitute definitive treatment for these conditions in most patients with severe disease and symptoms. With modern spinal instrumentation techniques, it is possible to decompress and at the same time stabilize the involved spinal segments, significantly improving the patients' quality of life.[3–8] Owing to the fear of severe complications, patients with significant disability due to stenosis are often not referred for operative treatment.

The purpose of this study is to relate the surgical risks involved in elective spinal decompression in the elderly population to total hip arthroplasty, a well-accepted operation for which the risks and benefits are well known. Total hip arthroplasty has gained widespread acceptance as a safe operation with predictable results that will lead to an improved quality of life for elderly patients. In many respects, it has become the standard to which the success of many orthopedic procedures is compared.[4]

Methods

The charts of 68 patients operated on for spinal decompression at 2 hospitals of the McGill University Health Centre over a 3-year period who fitted the inclusion criteria (Table 1) were reviewed. This group was compared to a similar group of 68 patients randomly selected from a pool of hip arthroplasty patients operated on during the same period. All patients in the spinal decompression group had degenerative lumbar spinal stenosis with significant symptoms related to their disease, ranging from intermittent claudication to paresis of the lower extremities. Bowel and bladder function was normal in all patients preoperatively. Three spine surgeons shared the spine operations, which were performed through a posterior approach, reflecting the paraspinal musculature. Laminectomies were performed at stenotic levels. When disk protrusion represented a significant element in the stenosis, a discectomy was performed. In cases of significant facet arthritis and lateral recess stenosis, a partial or complete and sometimes bilateral facetectomy with root decompression was performed. Gross segmental instability or facetectomy were indications for stabilization using the AO-Universal Spine System (Synthes, Spine; Paoli, Penn.). In all but 4 patients the bone graft was obtained from the posterior superior iliac spine (PSIS), through the midline incision with subcutaneous dissection laterally. In the 4 patients in whom this was not possible due to the level of the stenosis, separate incisions over the PSIS were required.

One arthroplasty surgeon performed all of the total hip arthroplasties, through a direct lateral (Hardinge) approach.[9] One patient required minor acetabular bone grafting. Postoperative complications were rated according to severity as life threatening, major or minor (Table 2). All patients in both groups received prophylactic antibiotics perioperatively and anticoagulation postoperatively. The *t*-test was used to detect significant differences in the various complications between the 2 groups; $p < 0.05$ was considered significant.

Results

The 2 populations examined were demographically similar. The average age in the hip group was 70.9 years and in the spine group was 70.3 years. Total hip arthroplasties were performed in 38 women and 30 men and spinal decompression was done in 41 women and 27 men. The average American Society of Anesthesiologists score, as assessed by the anesthesiologist, was 2.1 for both patient groups.

In the spine group, 58 patients had decompression and intertransverse bone grafting. Ten patients were treated with simple decompression laminectomy. The AO-Universal Spine System (Synthes) was used in 46 of the patients with intertransverse bone grafting owing to instability. The average number of decompressed lumbar spinal levels was 2.18 per person, with 15 having had 1 level decompressed, 35 patients 2 levels and 35 patients 3 or more levels.

In the hip group, 65 patients had degenerative arthrosis, 2 had had fractures and 1 had avascular necrosis of the femoral head. Thirty noncemented and 38 hybrid hip replacements were performed.

Table 1

Exclusion Criteria for 68 Patients Who Underwent Spinal Decompression and 68 Patients Who Had Total Hip Arthroplasty

Age, yr
< 65
> 80
Previous surgery
Spinal decompression
Hip surgery
Emergency procedures
Hip fractures
Spine fractures
Cauda equina syndrome
Bone disease
Primary or secondary bone
Metastatic

Operative blood loss and the postoperative hospital stay for the 2 groups were not significantly different. The only significantly different variable was the operative time with a mean (± standard deviation) time of 191 (23) minutes in the hip group and 278 (76) minutes for the spinal decompression group (Table 3). Assessment of the postoperative complications revealed no significant difference in the number of life-threatening or major complications between the 2 groups. The hip group had 12 major complications and the spine group 14. There was 1 life-threatening complication in each group. However, the number of minor complications was significantly different: in the spinal decompression group there were 125 such complications versus 62 in the hip group ($p < 0.05$).

Within the spinal decompression group, we could not register any significant difference in the postoperative complication rate or amount of blood lost between patients who had a bone graft placed and those who did not. Likewise, there was no difference in those parameters between patients who required instrumentation and those who did not. Specifically, there were no neurologic injuries due to the placement of pedicle screws.

Discussion

In our view, the comparison between postoperative complications of total hip arthroplasty and lumbar spinal decompression and fusion brings out a valid point. It serves to illustrate that, although complex, lumbar decompression and instrumentation of the spine can be performed safely with no more risk to the patient than would be expected from a total hip arthroplasty. This conclusion is based on our analysis of the perioperative complications of 2 patient groups consisting of 68 patients each.

To make any valid recommendations for the more liberal use of any operation, it must not only be safe but also offer a reasonable long-term benefit to the patient. Total hip arthroplasty is one such procedure, offering a tremendous improvement in the quality of life.[10] This makes it an optimal standard against which to compare other orthopedic procedures.

It is difficult to rival the excellent results of total hip arthroplasty in the long term, where survivorship rates

Table 2

Postoperative Complications After Total Hip Arthroplasty and Elective Spinal Decompression

	Group	
Complication	Total hip arthroplasty	Spinal decompression
Life threatening		
Respiratory failure	1	0
Pulmonary embolism	0	1
Total	**1**	**1**
Major		
Malignant arrythmia	1	2
Myocardial infarction/ischemia	3	1
Severe bronchospasm	1	1
Recurrent hip dislocation	1	0
Trochanteric fracture	4	0
Deep venous thrombosis	2	0
Congestive heart failure	0	1
Major lung atelectasis	0	1
Gastrointestinal bleeding	0	1
Material failure	0	1
Deep wound infection	0	4
Pyelonephritis	0	1
Cerebrospinal fistula	0	1
Total	**12**	**14**
Minor*		
Benign arrythmia	2	1
Constipation, vomiting, nausea, diarrhea	16	39
Minor wound problems	20	12
Urinary retention	10	46
Lower urinary tract infection	4	15
Hyperglycemia	1	1
Psychosis	4	9
Simple dislocation	1	0
Minor atelectasis	0	1
Eye infection	1	0
Allergic reaction	3	0
Seizure	0	1
Total	**62**	**125**

*Significant difference $p < 0.05$, χ^2 test.

Table 3

Operative Variables for Patients Who Underwent Total Hip Arthroplasty or Spinal Decompression

	Group, mean (and SD)	
Variable	Total hip arthroplasty	Spinal decompression
Operating time, min*	191 (23)	278 (76)
Blood loss, mL	704 (273)	823 (543)
Postoperative hospital stay, d	9.2 (5.0)	11.0 (6.0)

*Significant difference using unpaired *t*-test.

of first generation implants are 85% at 20 years.[11] In the hip population, the reoperation rate greatly depends on the patient's age at the time of implantation and varies from 27% in patients younger than 59 years to 7.5% in patients older than 65 years.[12] Hozack and associates[4] pointed out that in terms of patient satisfaction lumbar laminectomy for radiculopathy and total hip arthroplasty fared better than total hip revision, primary total knee arthroplasty or scoliosis surgery. Surgical decompression is successful in relieving symptoms of degenerative lumbar spinal stenosis in over 60% of patients treated.[3,5–7] In their meta-analysis of the literature from 1966 to 1991, Turner and colleagues[8] found that, on average, 64% of the patients treated surgically for lumbar spinal stenosis were reported to have good to excellent outcomes. Similarly, in their 438 patients, Airaksinen and associates[3] reported 62% good to excellent results at a mean (and standard deviation) of 4.3 (2.5) years with a mean (and SD) Oswestry disability score of 34 (18). The rate of reoperation for recurrent stenosis or back pain is between 17% and 27% for decompression without spondylodesis.[5,13] We agree with others that the number of reoperations due to recurrent stenosis can be significantly reduced when a fusion is added in the presence of unstable segments.[13,14]

Our results demonstrate that the incidence of major or life-threatening complications does not significantly differ between the elderly patients who undergo hip arthroplasty or those who have spinal decompression. The incidence of minor complications was significantly higher in the spinal decompression group, but these resolved with minimal treatment. Furthermore, they did not delay the discharge of the patients from the hospital. The majority of minor complications were gastrointestinal and urinary problems in both groups. Apparent in the spinal decompression group is the number of lower urinary tract problems (61), which make up almost half the minor complications in that group. We believe this is secondary to the prolonged use of bladder catheters. We now routinely remove bladder catheters on the second postoperative day after most spine operations. Four deep infections developed in the spine group despite routine preoperative administration of antibiotics. Possible explanations for this could be the increased operative time and the amount of soft-tissue stripping required, or it may be related to the repeated urinary tract instrumentation in these patients.

Conclusions

Elective lumbar spinal decompression in elderly patients with significant pain or disability due to degenerative lumbar spinal stenosis is worthwhile. We recommend judicious use of conservative measures, but encourage referral for surgical management when these fail. This operation, even when instrumentation and bone grafting are required, is not associated with more serious or life-threatening risks than a total hip replacement in elderly patients. Spinal decompression offers the patient a good chance of pain relief and improved function in the long term.

Competing interests: None declared.

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